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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/667,368

09/23/2003

Takafumi Noguchi

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SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

CHOI, JACOB Y

ART UNIT

PAPER NUMBER

2885

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/16/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/667,368

Applicant(s)

NOGUCHI, TAKAFUMI

Examiner

Jacob Y. Choi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 2, 2007 has been entered.

Response to Amendment

2. Examiner acknowledges that the applicant has amended claim 1, canceled claim 9 and newly added claims 13-22. Currently, claims **1-8 and 10-22** are pending in the application.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "*pitch*", "*depth*", "*convex-concave structure*", & "*diffraction grating structure*" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended

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replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim **15** is objected to because of the following informalities: the phrase "... *outermost surface said of said light-emitting portion ... etc.*" requires appropriate correction.
5. Claim **17** is objected to because of the following informalities: the phrase "... *the surface of said the other side ... etc.*" requires appropriate correction.
6. Claim **18** is objected to because of the following informalities: the phrase "... *the fine convex-concave structure to said the other surface ... etc.*" requires appropriate correction.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims **1-8 and 10-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobori (USPN 6,327,554) in view of ODA et al. (US 2002/0180348).

Regarding claim **1**, a light-emitting portion having a higher refractive index than a refractive index of air (e.g., 8, lines 20-35), and wherein a minimum light-emission value is equal to or less than 50% of a maximum light-emission value when white light is emitted from the light-emitting portion.

Kobori failed to disclose a diffraction grating structure.

ODA et al. teaches the diffraction grating structure formed as a constituent element on the organic electroluminescent device and provided to a light-emitting side surface (e.g., Figure 2) of the light-emitting outermost surface side of the light-emitting portion (e.g., Abstract: "... a diffraction grating is formed ... on the light output side ... etc.") and teaches a pitch of a fine convex-concave structure being in various range in μm .

First, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device and its viewing angle(s), also it is preferable for the grating structure with less internal reflection by adjusting the index

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of refraction in order to prevent light emitted from the organic EL being reflected at the grating structure and traveling backward.

Second, it would have been obvious to one having ordinary skill in the art at the time the invention was made to optimize the workable range of the diffusion grating to improve the light extraction efficiency of the device, also it is preferable for the grating structure with less internal reflection by adjusting the index of refraction in order to prevent light emitted from the organic EL being reflected at the grating structure and traveling backward, and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Note: Claims in a pending application should be given their broadest reasonable interpretation (e.g., "outermost"). *In re Pearson*, 181 USPQ 641 (CCPA 1974).

Things clearly shown in reference patent drawing qualify as prior art features, even though unexplained by the specification (e.g., "... a diffraction grating structure provided ... outermost surface side of the light-emitting portion ... etc."). *In re Mraz*, 173 USPQ 25 (CCPA 1972).

It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 2, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color separation filter (e.g., column 20, lines 1-20) provided between the light-emitting portion and the light-emitting side surface, wherein a minimum value of a spectral product obtained from a light-emission waveform of the white light emitted from the light-emitting portion and a spectral transmittance of the color-separation filter is equal to or less than 50 % of a maximum value (*at least 50 % in a wavelength region of 300 to 700 nm*) thereof,

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whereby the minimum light-emission value is equal to or less than 50 % of the maximum light-emission value when the white light is emitted from the light emitting portion.

Regarding claim 3, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color-separation filter (e.g., column 20, lines 1-20), which has minimum transmittance of equal to or less than 50 % of maximum transmittance is used for the color-separation filter.

Regarding claim 4, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion includes light-emitting materials for at least two primary colors capable of emitting the white light among light-emitting materials for three primary colors.

Note: It has been held that the recitation that an element is “*capable of*” performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchison*, 69 USPQ 138.

Regarding claim 5, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a light-emission ratio of the light-emitting materials for the at least two primary colors among the light-emitting materials for the three primary colors is adjusted to make the minimum light-emission colors is adjusted to make the minimum light-emission value equal to or less than 50 % of the maximum light-emission value when the white light is emitted form the light-emitting portion.

Regarding claim 6, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion includes the light-emitting materials for the three primary colors.

Regarding claim 7, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting materials exhibit light emission by singlet exciton (e.g., column 16, lines 5-10).

Regarding claim 8, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting materials exhibit light emission by triplet exciton (e.g., column 16, lines 5-10).

Regarding claim 10, Kobori discloses in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses a ratio of the depth to the pitch in the fine convex-concave structure ranges from 01-10 [0037]. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Note: It has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding claim 11, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion includes light-emitting materials (e.g., column 20, lines 1-20; "... *an optical thin film such as a dielectric multilayer film may be used ... gives out light from the phosphors contained therein for the color conversion of light emission, and is composed of three components, a binder, a fluorescent material and a light absorbing material ... etc.*") for at least two

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primary colors emitting the white light among light-emitting materials for three primary colors.

Regarding claim 12, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color-separation filter (e.g., column 20, lines 1-20; "... *the substrate may be provided with a color filter film ... it is preferable to control the properties of the color filter in conformity to the light emitted from the organic EL device ... thereby optimizing the efficiency of taking out light emission and color purity ... etc.*").

Kobori failed to suggest a spectral transmission of the color-separation filter is proximately 7% of a maximum value.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to specify the spectral transmission of the filter, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 13, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the combination of the light-emitting portion and the color separation filter suppresses the transmitted light to extent in the wave range ± 25 nm or more apart from the maximum light emission wavelength of the light-emitting materials (e.g., column 8, lines 20-60; "... a wavelength region of 300 to 700 nm ... etc.)).

Regarding claim 14, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color separation filter provided

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between the light-emitting portion and the light-emitting side surface, wherein a minimum value of a spectral product obtained from a light-emission waveform of the white light emitted from the light-emitting portion and a spectral transmittance of the color-separation filter is approximately 2% of a maximum value thereof (e.g., column 8, lines 20-60; "... a luminance variation n is confined within +_ 5% ... etc.).

Regarding claim 15, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the light-emitting portion comprising, a glass substrate (e.g., "p-layer"), a transparent electrode formed on one side of the glass substrate, a light-emitting layer (e.g., "de") formed on the transparent electrode and a rear electrode formed on the light-emitting layer (e.g., Figure 3). And ODA et al. teaches the diffraction grating structure is formed on the other side of the glass substrate [0006, 0049, 0052] that is the light-emitting outermost surface of the light-emitting portion (e.g., Figure 2). As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 16, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses a color separation filter (e.g., column 20, lines 1-20) formed between the glass substrate and the diffraction grating structure. It has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Regarding claim 17, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure is

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obtained by providing the fine convex-concave structure to the surface of the other side of the glass substrate. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 18, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure is formed by bonding an optical film separately manufactured as a transmission type optical film that has the fine convex-concave structure to the other surface of the glass substrate. It has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Note: The method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Regarding claim 19, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure is obtained by providing the fine convex-concave structure. It has been held rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 20, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the diffraction grating structure is formed by bonding an optical film separately manufactured as a transmission type optical film that has the fine convex-concave structure to the outer surface of the color separation filter. It has been held that constructing a formerly integral structure in various elements involves only routine skill in the art. *Nerwin v. Erlichman*, 168 USPQ 177, 179. As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Regarding claim 21, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, ODA et al. discloses the color separation filter is formed to have a single layer structure. It has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. *Howard v. Detroit Stove Works*, 150 U.S. 164 (1893). As explained above, it would have been obvious to modify teachings of Kobori with a diffraction grating element of ODA et al. to improve the light extraction efficiency of the device.

Note: The method of forming the device is not germane to the issue of patentability of the device itself. Therefore, this limitation has not been given patentable weight.

Regarding claim 22, Kobori in view of ODA et al. discloses the claimed invention, explained above. In addition, Kobori discloses the color separation filter is formed to have a multi-layer structure (e.g., column 20, lines 1-20) .

Response to Arguments

Applicant's arguments with respect to claims **1-8 and 10-12** have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tahara et al. (USPN 7,048,428) – light guide plate with convex portions having low radius of curvature tips, or low surface roughness (e.g., including workable range of a pitch and depth of the fine convex-concave structure).

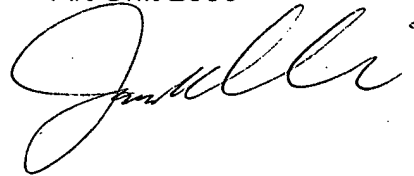
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Y. Choi whose telephone number is (571) 272-2367. The examiner can normally be reached on Monday-Friday (10:00-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong (James) Suk Lee can be reached on (571) 272-7044. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Jacob Y Choi
Examiner
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A handwritten signature in cursive script, appearing to read 'J Choi', written in black ink.

JC